

In this department of research, we are indeed placed in the anomalous position of being obliged to designate by distinct generic and specific names two organisms, as if they were totally independent, instead of being merely zooids of the same ovum—terms of one and the same unbroken life-series.

The necessity, however, which we are under of subjecting to distinct treatment, in descriptive zoology, the polypal and the medusal terms of this series, renders it impossible to abandon the practice, even though it be to a certain extent modified when continued observation shall enable us to refer every polype-sprung Medusa to its proper zoophyte.

## PROCEEDINGS OF LEARNED SOCIETIES.

### ZOOLOGICAL SOCIETY.

November 9, 1858.—Dr. Gray, F.R.S., V.P., in the Chair.

ON A LIVING OCTOPUS. BY J. P. G. SMITH, ESQ.  
IN A LETTER TO DR. GRAY, F.R.S.

“We found a Sea-spider at Goldthorpe Roads, in St. Bride’s Bay, which I brought home, and have examined with much interest. Its habits and attitudes are very different from anything I ever saw figured. I enclose a sketch of its appearance when at rest. It seems very well, and shows great objection to be disturbed.

“I noticed that the habit of the Cuttle-fish, when in a large pool on the sands, was to get into a corner formed by a piece of rock, and to fix itself by the suckers of the arms, sac downwards—and that much more flattened and spread out than when lying on the bottom of the vase; the eyes made the apex of an irregular obtuse pyramid. It assumed at times a much darker and richer colour, almost chestnut, mottled with lighter shades; and its skin became more wrinkled; and instead of two inspirations and exhalations in succession, it only made *one* at about the same intervals, but with a much stronger jet of water through the siphon. Upon my return, I placed it in a pitcher of salt water inside the large foot-bath; and while I ran to the sea to fill a vessel with fresh salt water, it had leaped out upon the verandah, and then fallen into the road beneath, by which it was so much injured that it died in the night. After death it became pallid, with scarcely a trace of colour left, and the eyes wide open, round, and black. I felt quite sorry to lose the brute: there was something exceedingly interesting and grotesque about its habits.

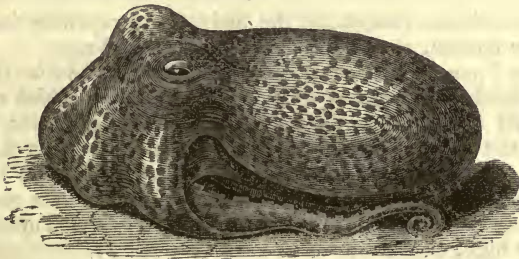
attended with loss of time and labour to others who may be working on the same field, and would admit of great abuse in the hands of less scrupulous investigators than my friend Dr. Wright.

While in the pool, it walked about occasionally on its arms, with a spider-like movement.

“The colour was fawn on the upper side of the body and exterior of the arms, striated with darker hues, forming a sort of wrinkled network; beneath and inside the arms it is of an opalescent white: when disturbed or touched, the fawn or reddish-brown colour changes to a pallid-bluish hue. The eyes are very prominent and frog-like: by day they remain nearly closed, with the exception of a narrow slit; but towards night they open wide, and show deep-black orbs, with the inside of the eyelids tipped with gold: the lids and the skin for some little distance beyond are of an intense blood-colour. The animal has the power of extending the area so coloured, which is largest at night-time and when disturbed; while at rest it subsides considerably, and the colour does not extend beyond the lids. The arms are eight in number, united at their thicker ends by a web of skin; inside, and to their extremities, they are studded with numerous suckers. The belly or sac has a wide valve-like opening beneath each eye, through which the creature inhales water, and then, closing them, drives it out with great force through one or other of the two siphons, which are also situated below the eyes, and close to the valves of the stomach.

“While at rest, it coils the arms together beneath the sac-like body, and remains, attached strongly by the suckers in the thick parts of its arms, at the bottom of the vase, the eyes uppermost; and the back, gently expanding and contracting, is bent forward over the arms; at long intervals it draws two deep inspirations, driving out the water through the siphons with great force. It uses only one siphon at a time; and the two inspirations follow in quick succession.

Fig. 1.



“I noticed the intervals of these deep inspirations as follows. R. means that the right siphon, and L. the left, was used.

	h.	m.	s.
R.....	10	3	15
R.....	10	7	25
R.....	10	10	40
R.....	10	15	0
R.....	10	20	0
L.....	10	25	20
R.....	10	30	15

“The appearance of the animal when in this position is wonderfully like a frog with a very large mouth, the marked division between the fawn and the whitish colour of the upper and under surface suggesting the idea of the line of the aperture of the mouth (see fig. 1).

“It seems to use the right- or left-hand siphon indifferently. The siphons are about  $\frac{1}{3}$ rd of an inch in diameter. It has the power of walking or moving about upon its arms. It swims rapidly in a

Fig. 2.



horizontal attitude, elongating the body, and propelling itself with a frog-like motion, by opening and contracting its arms.

“When I poured off the water, it discharged, at two or three jets through the siphons, a small quantity of black fluid, which remained undissolved for some time, in small cobweb-like clouds, floating about on the water. It has the power of contracting the skin above the eyes, so as to make a small horn-like projection; but this only rarely appears. The belly gives you more the idea of a *snout* than of anything else; it is about the size of a full-sized Turkey’s egg. It walked high, on the tips of its arms (see fig. 2).”

November 23, 1858.—Dr. Gray, V.P., F.R.S., in the Chair.

NOTICE OF FIVE SPECIES OF BATS IN THE COLLECTION OF  
L. L. DILLWYN, ESQ., M.P.; COLLECTED IN LABUAN BY  
MR. JAMES MOTLEY. BY ROBERT F. TOMES.

1. *PTEROPUS HYPOMELANUS*, Temm. Esquiss. Zool. i. p. 61, 1853.

Although the specimen of *Pteropus* included in the collection forwarded to me for examination differs very materially in colour from

the ordinary examples of the above species, the distribution of the colours themselves, and the quality and quantity of the fur, together with an absolute similarity in all other respects, including that of size, leave no doubt as to its identity with that species. In colour it more nearly resembles some of the examples of *P. funereus*, a species to which it cannot be referred, as it differs greatly, among other respects, in the form and size of its ears\*.

Instead of the usual light rufous on the nape and shoulders observable in the ordinary examples of *P. hypomelanus*, the specimen from Labuan has these parts of a purplish-brown, strongly tinged with claret-colour; the fur of the back is also darker; and the under parts, instead of being light reddish-brown, have the same dark-purplish colour as the back of the neck, but less bright.

I have compared the specimen with others from Ternate and from Macassar, the latter having been collected by Mr. Wallace. The comparatively short and rounded ears will at once distinguish the dark variety of this species from *P. funereus*, in which they are longer and more pointed.

2. *PACHYSOMA BREVICAUDATUM*, Is. Geoff.—*Vesp. marginatus*, Hamilton?—*Pteropus marginatus*, Horsf.—*Pt. marginatus*, *Pachysoma marginatum*, and *Pachysoma brevicaudatum*, Temm.—*Cynopterus marginatus* and *C. Horsfieldii*, Gray.

Of this species there are two specimens in the collection, both having the bright-rufous hair on the sides of the neck which characterizes the variety which has been called by Dr. Gray *Cynopterus Horsfieldii*. This vivid colouring occurs most frequently in the Ceylon specimens. After comparing a considerable number from various localities with the type specimens of *P. brevicaudatum* in the Paris Museum, I have arrived at the conclusion that all the above species, given as synonyms, are referable to it.

### 3. *PHYLLORRHINA LABUANENSIS*, n. s.

I have hitherto seen but one specimen of Horse-shoe Bat resembling the one from Labuan, and that was obtained at Sarawak by Mr. Wallace. Amongst all the descriptions of Asiatic *Rhinolophidae* which I have been able to examine, I have not hitherto met with one which applies to this species; and I therefore regard it as new, and describe it as follows:—

Facial crests, so far as can be ascertained from the inspection of dried specimens, very much like those of *Phyllorhina speoris*. Upper incisors rather broad and almost contiguous; in *P. speoris* they are narrow, and have a considerable central opening. Lower incisors small, very regular, and trilobed; canines, above and below, rather long and slender. Ears of medium size, as broad as high,

\* All the examples of *P. funereus* which I have examined have had the unworn teeth of young individuals, and moreover exhibited further indications of immaturity in the broad and flattened longitudinal crest of the cranium: in older examples this becomes prominent and acute. I regard the *P. funereus* as the young of *P. edulis*.

pointed, and the outer margin very faintly hollowed out towards the tip.

The wings are rather long and narrow, the fourth finger not exceeding in length the two basal phalanges of the longest finger. Thumb short, more than half enveloped in membrane.

Fur of the upper parts tricoloured, dusky-grey at the base, succeeded by yellowish-brown, and this again by darkish umber-brown, with the extreme tips a little paler. Beneath, the fur is faintly bicoloured, lightish brown at the base, with the tips of the hairs rather paler.

The specimen in my own collection, from Sarawak, differs in having the colours much more vivid. Fur of the upper parts bright cinnamon-brown for two-thirds of its length, succeeded by bright rufous of a somewhat darker hue, with the extreme tips of the hairs a little paler, giving, when viewed in some lights, a slightly hoary appearance. Beneath, the fur is lightish rufous, a little darker at the root than at the tip. Membranes rather dark and shining.

The following are the dimensions of these specimens:—

	Labuan.		Sarawak.	
	“	”	“	”
Length of the head and body, about ..	2	3	2	2
———— of the tail .....	0	10 $\frac{1}{2}$		
———— of the head .....	0	9 $\frac{1}{2}$	0	9 $\frac{1}{2}$
———— of the ears .....	0	5	0	5 $\frac{1}{2}$
Breadth of the ears .....	0	5 $\frac{1}{2}$	0	6
Length of the fore-arm .....	1	10	1	9 $\frac{1}{2}$
———— of the longest finger .....	2	10	2	7
———— of the fourth finger .....	2	1	1	11
———— of the thumb and claw .....	0	3	0	3
———— of the tibia .....	0	8 $\frac{1}{2}$	0	8
———— of the foot and claws .....	0	4	0	4
Expanse of wings .....	12	0	11	8

*Obs.*—The species to which this is most nearly affined is the *Phyllorhina speoris*; but it may be readily distinguished by the following points of difference:—*P. speoris* is constantly somewhat larger than the present species, and has the head, but more especially the canine teeth, considerably larger. The tibiæ, too, are not only longer in actual measure, but also longer in relation to the size of the animal, in *P. speoris*, than in the present species. Again, in *P. speoris* the free portion of the thumb is longer than the enclosed part, whilst in the present species the enclosed portion is the longer. To these differences may be added, that the membranes are much less translucent, but more shining, in the Labuan species than in *P. speoris*.

#### 4. SCOTOPHILUS NITIDUS, n. s.

In M. Temminck's monograph of the genus *Vespertilio*, several small Asiatic species are described which are affined to the common Pipistrelle Bat of Europe, and appertain to the genus *Scotophilus*.

They are mostly smaller than that species, but are characterized by the same subgeneric forms. The following are the species alluded to:—*Vesp. brachypterus*, *V. pachypus*, *V. abramus*, and *V. Akokomuli*\*.

To these may be added the *V. coromandelicus*, F. Cuv., one of the smallest Bats known; and the species I am about to describe must be placed in the same list.

In size it is one of the smallest, appearing but little larger than the *V. coromandelicus*; but on closer examination it is found to be considerably the larger of the two, the slenderness of the bones of the limbs tending to give it an unsubstantial and small appearance.

The head is somewhat more elevated, and the muzzle rather less obtuse than in *S. lobatus* or *S. coromandelicus*; but the ears and tragi are shaped precisely as in those species: viz. the ears are small and ovoid, with the ends rounded, and with scarcely a perceptible emargination at their outer margin; and the tragus is short, of nearly uniform breadth, curved inwards, and round at the end. As in the other species of this group, the wing-membranes spring from the base of the toes; and these latter constitute one-half the entire length of the foot. The free portion of the thumb is somewhat longer than that which is enclosed in the membrane. The tip of the tail is free. The bones of the wings and legs are more slender in relation to their length than those of its congeners; and the tibiæ are rather longer relatively.

The fur does not anywhere encroach on the membranes, either above or beneath, but is strictly confined to the body; it is of medium length, and thick and silky. That of the upper parts is unicoloured, dark chestnut-brown, without variation of tint on the different parts of the body; beneath bicoloured, dark brown at the base, tipped for a third of its length with reddish-brown, a little paler on the pubes.

Such is the colour of the specimens from Labuan; but two others in my own collection, obtained by Mr. Wallace at Sarawak, have all the upper parts of a dark shining brown, with scarcely a tinge of chestnut; and the under parts have the fur tipped with greyish-brown instead of rufous.

The cranium, in its general conformation, closely resembles that

\* I do not include the *V. tralatitius* of the same author, because it has been shown by Dr. Gray to be quite a distinct species from the original *V. tralatitius* of Dr. Horsfield. It is in fact a true *Vespertilio*, bearing a great resemblance to the *V. mystacinus* of Europe. *V. tenuis*, according to M. Temminck, is so closely allied to it, as to be with difficulty distinguished from it; and we are therefore led to believe that this is a true *Vespertilio* also. The so-called *V. imbricatus* of Temminck answers well to the true *V. tralatitius*, and is, I have no doubt, referable to that species. Of the *V. imbricatus* of Dr. Horsfield I have as yet seen but one example, the type specimen, in the Museum at the India House. *V. brachypterus* is most likely the young of *V. tralatitius* of Horsfield. *V. pachypus* is probably a good species; and the same may be said of *V. Akokomuli*; but M. Temminck's description and figures of *V. abramus* apply so exactly to the *Scotophilus lobatus* of Gray, that it will probably have to be quoted as a synonym of the latter species.

of the *Pipistrelle*, but has the facial portion a little broader. As in that species, there is a rudimentary premolar, immediately behind the upper canine, and placed in a line with the other teeth, so as to be visible from the outside. In *S. tralatitius* the second premolar is contiguous to the canine, and the first or rudimentary one is placed in the angle formed by the two, and is only seen from the inside. But the greatest peculiarity exists in the form and arrangement of the upper incisors. In the generality of species appertaining to this group, they are arranged in pairs, with a considerable central opening, and the two inner ones somewhat longer than the outer, and more or less in advance of them; but in the present species, the outer ones, adjoining the canines, are more in advance than the inner ones, and are merely rudimentary. The curve which is made by the row of upper incisors has, by this arrangement, its concave surface directed forwards instead of backwards, as in other species.

The number of the teeth may be thus given:—

$$\text{Inc. } \frac{2-2}{6}; \text{ Can. } \frac{1-1}{1-1}; \text{ Prem. } \frac{2-2}{2-2}; \text{ Mol. } \frac{3-3}{3-3} = \frac{16}{18}.$$

	Labuan.		Sarawak.	
	"	"	"	"
Length of the head and body . . . . .	1	6	1	6
— of the tail . . . . .	1	3	1	3
— of the head . . . . .	0	6	0	6½
— of the ears . . . . .	0	2½	0	3
— of the tragus . . . . .	0	1½	0	2
— of the fore-arm . . . . .	1	2	1	1½
— of the longest finger . . . . .	2	2	2	3
— of the fourth do. . . . .	1	6	1	7
— of the thumb . . . . .	0	3	0	2½
— of the tibia . . . . .	0	5¾	0	6
— of the foot and claws . . . . .	0	3½	0	3
Expanse of wings . . . . .	9	0	8	9

The above are the dimensions of two *adult* individuals from the localities mentioned; younger ones differ in having the *fingers* considerably shorter, and the *fore-arm* a little shorter.

##### 5. SCOTOPHILUS CIRCUMDATUS? *Vespertilio circumdatus*, Temm.

I refer this species, with some doubt, to the *V. circumdatus* of M. Temminck. It agrees with it in most particulars, such as the form of the head and ears, and in having the wing-membranes extending only to the extremity of the tibiæ; but it differs in being somewhat smaller, in having the fur shortish and unicoloured, whereas that of *circumdatus* is, according to M. Temminck, long, and of two colours.

For the present, I prefer leaving it under the name above given, until a greater number of specimens can be examined.

I have to thank Mr. Dillwyn for the opportunity of describing the species mentioned in this paper, and for the great liberality with which he has allowed me to make any use of his specimens which might be desirable for the purpose of description.

ON TWO SPECIES OF ANT-BIRDS IN THE COLLECTION OF THE DERBY MUSEUM, AT LIVERPOOL. BY PHILIP LUTLEY SCLATER.

1. MYRMECIZA EXSUL, sp. nov.

*Obscure brunnescenti-castanea, cauda concolore; capite toto undique et corpore infra ad medium ventrem nigris: ventre imo crisso et hypochondriis dorso concoloribus: alarum tectricibus minoribus nigricantibus ad apicem albo punctatis: campterio albo: rostro nigro, pedibus obscure brunneis: periophthalmio denudato.*

Long. tota 5·0, alæ 2·5, caudæ 1·7, rostri a rictu 0·85, tarsi 1·2.

*Hab.* In isthmo Panama (*Delattre*) et in rep. Nicaragua.

*Mus.* Derbiano, sp. 4939, et Acad. Philadelph.

This species may be placed between *M. hemimelæna* and *M. cinnamomea* in my arrangement. In colouring it somewhat resembles the former, but it is of a much stronger build, and has no white markings on the interscapularies. The bill is shorter than in *M. cinnamomea*, but the form otherwise nearly similar. The single specimen in the Derby Museum is marked with one of *Delattre's* tickets, "Mâle, Panama," and was acquired by the late Lord Derby in 1846. Another example of this same bird, of which I have a note, is in the splendid collection belonging to the Academy of Natural Sciences of Philadelphia; it is labelled 'Nicaragua.' I took a description of it in the autumn of 1856, but was loath to publish it without seeing a second specimen.

2. DYSITHAMNUS OLIVACEUS.

*Thamnophilus olivaceus*, Tsch. Consp. Av. p. 278, et Faun. Per. p. 174.

*Dysithamnus olivaceus*, Cab. Orn. Not. i. 223; Bp. Consp. p. 199.

♂. *Olivaceus: pileo cinerascente, capitis lateribus concoloribus: subtus pallide cinereus; gutture ventre medio et crisso albicantibus: campterio albo: alarum tectricibus albo anguste marginatis.*

Long. tota 5·0, alæ 2·5, caudæ 1·7.

*Hab.* In Bolivia (*Bridges*).

*Mus.* Derbiano.

A distinct species of *Dysithamnus* nearly allied to *D. mentalis*, but recognizable by the absence of the black ear-mark, and darker colour of the sides below. The example in the Derby Museum from which I take my characters, was obtained through Mr. Cuming in 1846, and was doubtless among the Bolivian birds collected by Mr. Bridges.

I have to express my acknowledgments of the liberality of the Trustees of the Derby Museum, in allowing me the use of these and several other birds for examination. Without actual comparison of specimens it is nearly hopeless to attempt to determine species of this and other similarly-complicated groups.



December 14, 1858.—Dr. Gray, F.R.S., V.P., in the Chair.

ON ZOANTHUS COUCHII, JOHNSTON.

By E. W. H. HOLDSWORTH, F.L.S., F.Z.S., ETC.

The existence in our seas of a compound Zoophyte belonging to a group so essentially tropical as the *Zoanthidæ*, was first made known by Mr. R. Q. Couch, who obtained a small species from deep water near the Cornish coast. It was subsequently described and figured in Dr. Johnston's 'British Zoophytes,' and has been since eagerly sought for, but apparently without success; or if captured, its characters have not been positively recognized. There is reason, however, to believe that the original description was imperfect; and it is probable that specimens of a compound Polype, found by Mr. Barlee and others along our northern coasts, and some lately obtained by myself in Torbay, may all be referred to *Zoanthus Couchii*. They are certainly identical with the animal which Dr. Johnston placed with some hesitation among the Sponges, and described under the name of *Dysidea papillosa*; and this was believed by Prof. Edward Forbes to be the same as the Cornish *Zoanthus*.—As the specimens recently found differ in some important particulars from those described by Mr. Couch, I have thought it desirable to point out their characters, and to give some details of certain parts of their structure which are peculiar to the family *Zoanthidæ*, leaving their specific distinctness an open question, until we know more of the original *Zoanthus Couchii*.

The living polypes exhibited were dredged on the 12th of October last, in 10 or 12 fathoms water, at about a mile from the eastern headland of Torbay, and, although small, agree in other respects with the probably maturer examples from other parts of the coast. The special characters of the *Zoanthidæ*, which consist in their increase by budding, and their mode of distribution over the surfaces to which they are attached, are subject in this species to considerable variation. One group of six polypes, on the inside of a valve of *Cardium rusticum*, is arranged in a linear series, as in the typical forms of the restricted genus *Zoanthus*, and is the result of budding in one direction only; others are scattered over the surface of a flat stone, and have no perceptible connexion with one another, except in a few instances where two or three of them are united; the isolated polypes are perhaps the produce of separate ova, and in time may develop their compound character by the usual process of gemmation. Another form of growth is the one under which this zoophyte has been most commonly known as *Dysidea papillosa*, and may be well seen in a remarkably fine specimen from Shetland, and now in the collection at the British Museum. In this example the polypes form a compact group, connected in every direction by a general expansion of the basal membrane, which is extended over the whole outer surface of a small univalve shell, and also lines the interior for a considerable distance. Mr. Alder has observed that a *Natica* is the usual support for this form of development; but in this instance the shape of the incrusting mass is more like that of a small

*Buccinum*, or a *Purpura*. In these varying modes of growth, we find a gradual transition from the linear budding of *Zoanthus* proper to the aggregation of the polypes in some species of *Polythoa*; but in the typical members of the latter genus, the polypes are not only connected at the base, but have their bodies also severally united, so as to form a solid mass; and a more decidedly compound nature exists in them than we find in any of the varieties of the present species; so that, although partaking of the characters of both genera, *Zoanthus* appears to be the one to which this is most nearly allied. An evident approach to the same intermediate form may be observed in the reticulate arrangement of the connecting bands of *Z. Bertholetii* from the Red Sea.

In our British species, the body forms a cylinder from 2 to 4 lines high, by about half that in breadth, and is clothed with a dense coating of fine sand, which at the upper extremity is divided into 14 deeply-cut marginal teeth; these cover the top of the column when the animal is closed, but are turned a little outwards during expansion. The tentacula are moderate in length, slightly tapering, smooth, and not capitate; they are arranged in two rows containing 14 each, of which the inner series are rather the longer, and are placed opposite the angular prolongations of the column, those of the outer row alternating with them. Fourteen tentacles in each row appear to be a character of specific value, as I find that number constant in specimens of various sizes, and they correspond with the marginal divisions. The disk, which is generally concave, somewhat exceeds the diameter of the body; and the prominent mouth opens with a simple linear orifice. The general colour of the disk and tentacula is a pale transparent brown, becoming opaque white around the mouth and at the tips of the arms; and all the intermediate parts are finely speckled with the same tint. At first sight the tentacles appear to be knobbed, as in *Corynactis* and some of the Coraligenous Polypes; but their form is really quite simple, and the capitate appearance of these organs is due solely to the conspicuous colour of their extremities.

Among the external characters of this family, the serrated margin of the column is remarkable; but an examination of the animal shows that this structure is a simple provision for enabling a polype so peculiarly coated to close its disk perfectly, and in the contracted state to be completely protected by its sandy covering. Closure of the disk in the soft-bodied *Actiniæ* is effected by the action of the muscles surrounding the upper extremity of the body; and as the skin is soft and yielding, contraction takes place equally on every side, and is continued until the edges of the column meet in the centre. In *Zoanthus*, the case is different; fine sand being densely impacted into the epidermis, little or no contraction can take place, and the polype would be unable to close in the usual manner if this hard covering were uniformly extended to the margin of the disk. Under the microscope, the wall of the column is seen to terminate in a number of triangular processes or teeth, united at the base, and covered externally with sand like the rest of the body; these prolongations are connected throughout their length by a thin membrane,

which is crossed by the ordinary transverse muscles, whose contraction brings the edges of the teeth in contact, at the same time necessarily inclining them towards the centre, and thus effectually closes the disk; the animal being then entirely covered and protected by the investing sandy coat. It will be observed that the apparently marginal teeth are in reality only parts of the wall of the column, and that intervening triangular pieces are as it were excavated from the integuments, leaving only the internal membrane and muscular bands. The nature of this adventitious covering also deserves attention, being the only character in which this polype at all resembles *Dysidea fragilis*, the sponge with which it was formerly associated. It is almost entirely composed of fine angular particles of siliceous sand, brought in contact with the body and connecting membrane of the polype by the action of the sea, and retained by, and incorporated in the cuticle; its extraneous character is evident from the occasional presence of other matters mixed with the sand, but the latter substance is in most cases the only material employed. Similar grains of sand abound in the sponge; they are not confined, however, to the exterior, but are scattered throughout the mass, and cover the inter-lacing fibres in every direction.

Independently of its different composition, this sandy coating in *Zoanthus* cannot be regarded as at all analogous to the true corallum of the Madreporæ. Here it is the actual polype which is enclosed in the hard covering, and this, when tested with nitric acid, shows no trace of calcareous matter; in the Madreporæ, on the contrary, the polype is as delicate and soft-bodied as any of the *Actiniæ*, and when expanded, rises above and clothes the upper portion of the corallum, which is entirely secreted by the internal tissues of the animal, and is composed essentially of carbonate of lime extracted from the seawater; in fact, the hard parts constitute an external covering in the one animal, and an internal skeleton in the other.

In its explanate growth, or increase by budding from the base only, *Zoanthus* strongly resembles the *Caryophyllaceæ*, and by some naturalists is associated with that tribe of Coralligenous Polypes; but many of its characters point to a nearer relationship to the *Actinidæ*, in which we sometimes find a similar deposition of extraneous matter on the cuticle, although in a slighter degree and less persistent: the smooth simple tentacula are also very unlike those of the Coral Polypes, in which their surface is generally studded with little wart-like prominences enclosing the thread-cells. With our present scanty knowledge of the *Actinidæ* found in different parts of the world, and the insufficient descriptions that we possess of most of the coral animals, it is difficult, if not impossible, to determine the true position of the *Zoanthidæ* among the Helianthoid Polypes. An examination of the tropical seas, in which they abound, and where they attain a size considerably exceeding that of our British species, may lead to the discovery of intermediate forms showing the true affinities of this now isolated group; but at present I am inclined to regard them as representing the budding form of growth in the Non-coraligenous Zoophytes, as the fissiparous mode of increase is exemplified in many of the true *Actiniæ*.

On the 9th of November last, Dr. Gray brought before this Society a notice of a curious form of *Zoanthus* sent to him by Mr. George Barlee from the Shetland seas, and for the reception of which he proposed the new genus *Sidisia*. He has kindly allowed me to describe this polype; and it is therefore with some regret that, after a careful examination of it, I must question its generic or even specific distinction from *Zoanthus Couchii*, the subject of the previous part of this paper. The great peculiarity of these polypes consists in their being entirely free, no parts of the specimens at the British Museum showing any superficial trace of attachment. Another remarkable character is their irregular mode of budding, and may be briefly described as one polype growing out from another without the intervention of the usual connecting bands; this budding takes place from the base of the parent polype in an opposite direction, or at various angles with the original line of growth, the branches again sometimes throwing out buds from near their own bases. Mr. Barlee states that some of the specimens were attached, but most of them came up in the dredge free, and that they abounded on muddy ground. This situation is I think very significant, and sufficient to explain the peculiarities of the animal. As I have before mentioned, it is the habit of *Zoanthus* to be attached to some stone or shell, and the first sign of its increase is in the expansion of the basal membrane either on one or all sides of the polype; from this expansion the young bud forth at various distances from the parent, and they in time develop similar offshoots. Such is the case when the ova fall on places suited to their natural growth; but if by chance they are deposited on a muddy bottom, or where the stones are only large enough to afford attachment to a single polype, I think an irregular mode of growth may be reasonably anticipated, and a variation expected in the character which, above all others, is likely to be affected by the change of circumstances. By the motion of the sea, the position of these free polypes must be continually shifting, consequently no part of their surface can be permanently uppermost; and under these circumstances, with a natural tendency to grow upwards, regularity of budding would seem to be impossible. As might be expected, scarcely two of the specimens I have seen are precisely alike, which adds to the probability of the suggested explanation of their irregular growth. The fact of the characters of the disk, and the number of the tentacula and marginal divisions being identical with those of the animals first described, is a strong argument also in favour of their all being only different forms of the same species.

*Additional Observations, communicated March 8, 1859.*

Some fine groups of *Zoanthus Couchii* from Torbay having lately come under my notice, I have been enabled to obtain a better knowledge of the species than I possessed when I recently laid before the Society a description of its characters. I therefore venture to add a few remarks on certain points, which before were considered as relating to particular specimens, rather than to the species generally.

First, as to size. The dimensions given in my previous communication were those of the largest polypes that I had seen alive, which were described as being from 2 to  $3\frac{1}{2}$  lines in height by about  $1\frac{1}{2}$  in breadth; such also is the size of many that I have seen since; but among them have been several examples in which these measurements have been nearly doubled, and with the increase of size a power of varying the shape of the body has been exhibited, almost equalling that of *Corynactis*, so well known for the remarkable changes of form that it undergoes. This mutability of shape is dependent in a great measure on the degree of density of the external coating of sand, which does not increase in proportion to the growth of the animal; so that while the half-grown polype is closely imprisoned in its hard covering, older and larger individuals are less thickly clothed; and when in a state of expansion, the grains of sand are sufficiently separated to allow the integument to be seen between them, and thus to permit that mobility of body which is so characteristic of the *Zoanthidæ*. The rigid form in the first specimens that I examined, was one of the difficulties that I met with in identifying them with Mr. Couch's description of the species.

There are some other points of disagreement which I have little hesitation in saying are due to a misconception on the part of Mr. Couch when preparing the original description. I refer especially to the statement that "the surface of the body is minutely glandular," and that "radiating from the mouth are numerous rows of whitish glandular-looking bodies, which are the tentacula in a contracted state;" in both these cases it is evident that the character of the sandy covering has been misunderstood. Secondly, as to the growth of the basal membrane. I have previously referred to it under the linear and expanded forms, which I then ventured to think were only modifications in the development of one species: the recently captured specimens throw some further light on the subject. Among various groups on one large shell, I have found lines of polypes sometimes sending out lateral shoots from the basal membrane, and these again dividing; others expanding, so as to include two or three polypes in parallel series, and in one instance a single specimen was observed with the basal expansion extending equally on every side: again, the membrane leading from a group spreads at times over the surface of the shell in an irregular manner for a considerable distance, without any bud arising from it; so that no special form of growth can be considered as characteristic of the connecting membrane in this species. The rate of development in the members of a group is also of the same uncertain character—a large polype being occasionally followed by a very small one, and that succeeded by two or three of intermediate but varying size; in fact, except in certain characters, the development of this *Zoanthus* is subject to great irregularity; and the cases above mentioned appear to me to confirm the opinion that I have before expressed of the specific identity of the linear form of growth with that which has been found in the Northern seas, overspreading the entire surface of small univalves.